

Claims:

Sub B7
1) Method for reducing the danger to vehicular passengers and animals of heat prostration or suffocation upon being trapped in a hot, closed vehicle comprising the steps of:

5 a) monitoring the temperature of at least one of a vehicle interior space and the exterior ambient temperature;

b) triggering at least one of an interior alert, an exterior alert, a heat relief measure, and a passenger release measure in response to the monitored temperature satisfying a predetermined criteria.

2) Method as in claim 1 which includes the step of:

10 a) sensing a vehicle condition selected from vehicle ignition state, vehicle stopped, door open/closed, parking brake on, and occupancy state; and wherein said triggering is in response to said sensed condition and said temperature satisfying predetermined criteria.

3) Method as in claim 2 wherein said temperature monitored is the temperature of at least one vehicle interior space selected from a passenger compartment and a load space.

15 4) Method as in claim 3 wherein said occupancy state sensing steps includes the step of evaluating the output of at least one sensor selected from an ultrasound sensor, an IR sensor, an imaging sensor, a microphone, a seat sensor, a capacitance sensor, a motion sensor, and a floor sensor.

20 5) Method as in claim 1 wherein said temperature monitoring steps includes extracting temperature data from an ultrasound sensor.

Sub B8
6) Method as in claim 1 which includes the steps of progressively triggering at least two of said interior warning, said exterior warning, said passenger/animal relief and said passenger/animal release.

25 7) Method as in claim 6 wherein said steps of triggering said interior warning includes activating at least one of a voice announcement, a warning sound, and an illuminated warning.

8) Method as in claim 6 wherein said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message.

30 9) Method as in claim 6 wherein said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan,

turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers.

10) Method as in claim 5 wherein said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door, opening a window or roof panel and deploying a ramp or lift.

11) Method for providing an alert to assist in avoiding development of heat condition in the interior of a vehicle that is dangerous to non-abled human and animal occupants, comprising the steps of:

a) providing a reminder device for the vehicle driver and able passengers of the presence of non-abled vehicle occupants.

b) arming said reminder device upon inclusion of at least one non-abled occupant in said vehicle;

c) sensing at least one of said driver or an able passenger leaving said vehicle, vehicle ignition OFF after a period of ignition ON, vehicle stopped, and at least one of the driver and an able passenger door opening or/closing; and

d) triggering said reminder upon at least one of said sensed conditions occurring so that reminder can alert at least one of said driver and said able passenger to not leave said non-abled occupant untended in the vehicle to suffer from heat-induced injury.

12) Method as in claim 10 wherein said alert is selected from at least one of a light, a lighted message, a sound alarm and a voice announcement.

13) Method as in claim 11 which includes the added step of triggering at least one of an exterior alert, a heat relief measure and a release measure in response to at least one of said sensed conditions occurring.

14) Method as in claim 13 wherein said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message.

15) Method as in claim 13 wherein said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers.

16) Method as in claim 13 wherein said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door, opening a window or roof panel and deploying a ramp or lift

Sub B12
17) Apparatus system for reminding or warning against development of excess heat conditions in vehicle passenger and/or load spaces, comprising in operative combination:

a) at least one temperature sensor for monitoring at least one of a vehicle interior space and the exterior ambient temperature;

b) at least one warning device mounted in association with said vehicle for at least one of:

10 i) reminding against leaving a non-abled passenger or animal in the vehicle; and

ii) warning of at least one sensed temperature condition exterior or interior of said vehicle that tends toward danger for a non-abled passenger or animal in said vehicle space;

15 18) System as in claim 17 wherein said warning device comprises an initializable sound or visual reminder unit electrically linked to at least one vehicle door open/close sensor, so that after initializing, upon said vehicle door being sensed as opened or/and closed, said reminder unit warning is activated.

20 19) System as in claim 18 wherein said reminder unit includes means for manual initialization.

20) System as in claim 18 wherein said reminder unit is initialized in response to a predetermined temperature being sensed.

Sub B13
21) System as in claim 17 wherein said warning device is responsive to a predetermined temperature being sensed

25 22) System as in claim 21 wherein said system includes

c) at least one vehicle condition sensor that provides an output of at least one of vehicle ignition state, vehicle stopped, door open/close, parking brake on. and occupancy state;

d) a controller for evaluating said temperature sensed and said vehicle condition output; and

30 e) said controller, in response to at least one preselected set of temperature and

vehicle conditions, triggers said warning device.

23) System as in claim 22 wherein said controller progressively triggers at least two of an interior vehicle warning, an exterior warning, a passenger/animal relief measure and a passenger/animal release measure.

5 24) System as in claim 23 wherein said interior warning is selected from a voice announcement, a warning sound, and an illuminated warning.

25) System as in claim 23 wherein said exterior warning is selected from flashing vehicle lights, sounding a horn, sounding an alarm system siren, and an RF call out.

10 26) System as in claim 23 wherein said passenger/animal relief is selected from opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, darkening or increasing reflectivity of windows, and providing location information to rescuers.

15 27) System as in claim 23 wherein said passenger/animal release is selected from disconnecting a seatbelt, unlocking a door, opening a window or roof panel, opening a door, and deploying a ramp or lift.

Sub B14 28) System as in claim 22 wherein said occupancy state sensor comprises at least one of an ultrasound sensor, an IR sensor, an imaging sensor, a microphone, a seat sensor, a floor sensor, a capacitance sensor, and a motion sensor.

20 29) System as in claim 23 wherein interior passenger space temperature data is extracted from the return signal output from said ultrasound sensor.

Sub B16 30) A computer readable media storing computer executable instructions that, when executed by at least one processor, performs the method of claim 1.

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ADD B9
ADD B15
ADD B17